

**WHAT IS CLAIMED IS:**

1. A method of peak-to-average reduction of an oversampled signal for a digital communication system, comprising:

detecting a first peak portion of an input signal that exceeds a  
5 predetermined threshold;

determining a width of said first peak portion;

applying a first shaping response to said first peak portion, said first  
shaping response having a variable width; and

varying said first shaping response width responsive to said first peak  
10 portion width.

2. The method of Claim 1, wherein said first shaping response further having  
a variable scale factor determined by a difference of said predetermined threshold  
and a peak magnitude of said first peak portion.

3. The method of Claim 1, wherein said determining a width of said first  
15 peak portion includes estimating a number of samples which exceed said  
predetermined threshold.

4. The method of Claim 3, wherein said first shaping response variable width is indicative of said estimated number of samples which exceed said predetermined threshold.

5. The method of Claim 1 further comprising determining a second peak  
5 portion of said input signal which exceeds said predetermined threshold.

6. The method of Claim 5 further comprising:

determining a width of said second peak portion; and

applying a second shaping response to said second peak portion, wherein  
said second shaping response having a variable width responsive to said second  
10 peak portion.

7. The method of Claim 6, wherein said determining a width of said second  
peak portion includes estimating a number of samples which exceed said  
predetermined threshold.

15 8. The method of Claim 7, wherein said second shaping response variable  
width is indicative of said estimated number of samples which exceed said  
predetermined threshold.

9. The method of Claim 1 further including applying a first echo modifier subsequent to application of said first shaping response, said first echo modifier having a variable scale.

10. The method of Claim 9 further including varying said first echo modifier  
5 scale in response to said determined width of said first peak portion.

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11. An apparatus for peak-to-average reduction of an over-sampled signal in a digital communication system, comprising:

a buffer having an input adapted to receive said oversampled signal and operable to delay said oversampled signal by a predetermined number of samples;

5 a detector coupled to said buffer and operable to determine a first peak portion for said oversampled signal wherein at least a portion of said first peak exceeds a predetermined threshold, said detector further operable to estimate a width of said first peak portion;

a first modifying unit having an input adapted to receive an indication  
10 from said detector of said first peak portion width and operable to apply a variable width first shaping response to said first peak portion width subsequent to said oversampled signal output from said buffer.

12. The apparatus of Claim 11, wherein application of said variable width first shaping response to said first peak portion results is a first modified peak portion  
15 below said predetermined threshold.

13. The apparatus of Claim 11, wherein said variable width first shaping response is indicative of said estimated width of said first peak portion.

14. The apparatus of Claim 11, wherein said first shaping response further having a variable scale factor determined by a difference of said predetermined threshold and a peak magnitude of said first peak portion.

15. The apparatus of Claim 11, wherein said detector further operable to  
5 estimate a number of samples of said first peak portion which exceed said predetermined threshold.

16. The apparatus of Claim 11, wherein said detector further operable to determine a second peak of said received signal wherein at least a portion of said second peak exceeds said predetermined threshold.

10 17. The apparatus of Claim 16, wherein said detector is further operable to estimate a width of said second peak portion which exceeds said predetermined threshold.

18. The apparatus of Claim 17 further including a second modifying unit having an input adapted to receive an indication from said detector of said second  
15 peak portion width and operable to apply a variable width second shaping response to said second peak portion width.

19. The apparatus of Claim 18, wherein said second shaping response variable width is indicative of said estimated width of said second peak portion.

20. A system for peak-to-average reduction of an oversampled signal for a transceiver comprising a transmit portion and a receive portion coupled via a hybrid circuit, said system comprising:

a buffer having an input adapted to receive said oversampled signal on  
5 said transmit portion and operable to delay said oversampled signal by a predetermine number of samples;

a transmit peak detector coupled to said buffer and operable to determine a first peak for said oversampled signal, wherein at least a portion of said first peak exceeds a predetermined threshold;

10 a modifying unit having an input adapted to receive an indication from said transmit peak detector of said first peak portion and operable to apply a first shape modifier to said first peak portion subsequent to said oversampled signal output from said buffer; and

a shape canceller coupled to said receiver portion and having an input  
15 adapted to receive an indication from said transmit peak detector and operable to apply a variable scale cancellation signal subsequent to application of said first shape modifier.

